SOUTHERN REGION GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **S048 Castle Back Slope Failures**	HIGHWAY & KM: 3:04, 23.708	PREVIOUS INSPECTION DATE: June 8, 2021	INSPECTION DATE: **May 8, 2023**
LEGAL DESCRIPTION: 15/06-12-007-01 W5M	NAD 83 COORDINATES: UTM 11 Northing 5492157 Easting 715695	RISK ASSESMENT: PF: 9 CF: 3 TOTAL: 27	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 4,100 (west), 4,340 (east), (Ref. No. 78050)		CONTRACTOR MAINTENANCE AREA (CMA): 26	

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
None present LAST READING DATE: N/A	Chris Grapel (KCB) Peter Roy (KCB) Alex Frotten (AT) Roger Skirrow (AT)

PRIMARY SITE ISSUE: Multiple slope failures on the south bank of the highway into the ditch extending up to 4 m onto private land. The slope failures are coalescing to form larger backslope failure areas and toe rolls are blocking the ditch.

APPROXIMATE DIMENSIONS: Approximately 200 m length of 6 m to 10 m high back slope. The slope is approximately 3H:1V.

DATE OF ANY REMEDIAL ACTION: No recent remedial measures have been undertaken.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	Failures are not affecting the highway.		X
Slope Movement	X		Slope above the highway has failed in multiple locations.		X
Erosion	X		Some erosion of the failed material in the ditch.		X
Seepage	X		Some moist soil in the slide areas.		X
Culvert Distress		X	None observed.		X

COMMENTS

During the 2023 inspection, the lateral extents of the slope failure appeared similar to 2021. In the slide zones, the near vertical upper back scarp is up to 1.8 m high. Tension cracking near the crest indicates ongoing slope movement and slide retrogression. Failure zones are coalescing, and will eventually result in one long failure zone after which further retrogression into private land may occur.

Slide zones are located over approximately 200 m length on the south side of the highway. Slides appear to be a result of groundwater and precipitation leading to saturation of the slope south of the highway. The north-facing aspect of the slide will decrease evapo-transpiration from the slope surface and promote a longer duration of snow cover in the spring. The highest stable slope is approximately 5.5 m, located at the east end of the north facing backslope.

The field located at the top of the slope failure is mostly graded towards the river and crop furrows are parallel to the fence line meaning that surface runoff is likely to drain away from the highway.

Zones of accumulation at the toe of the slide are blocking the ditch over the length of the failure. Areas of ponded water were noted along the length of the ditch.

A Shaw utility line is located approximately a quarter of the way up the slope. The utility cable is marked with a sign.

The south-facing backslope north of the highway is stable.

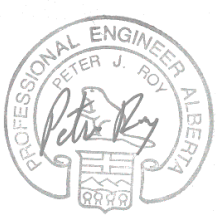
Recommended Mitigation Measures:

Short Term:

- The drainage ditch should be regraded to allow for positive surface water drainage, this will require the removal of the slide toe materials from the ditch. Materials removed should be kept to the minimum required to re-establish drainage without initiating additional slope movements.

Long Term:

- Flatten the slope to 4H:1V or 5H:1V, which would require moving the fence line back on the slope crest. A preliminary design should be prepared to assess slope flattening and the area of land required should be assessed. KCB could prepare the preliminary design without investigation, with AT putting the investigation costs into land purchase. AT land agents should contact the owner of the land at the crest of the backslope and start discussions on land procurement.
- Material excavated during slope flattening could be stockpiled in low area to the southwest of the site, levelling the area for possible future use by the farmer. The stockpile/fill placement should consider the potential for destabilizing the Oldman River slope near the Hwy 3 bridge.



13 Oct. 2023
ID 141695

Peter Roy, P.Eng.
Civil Engineer

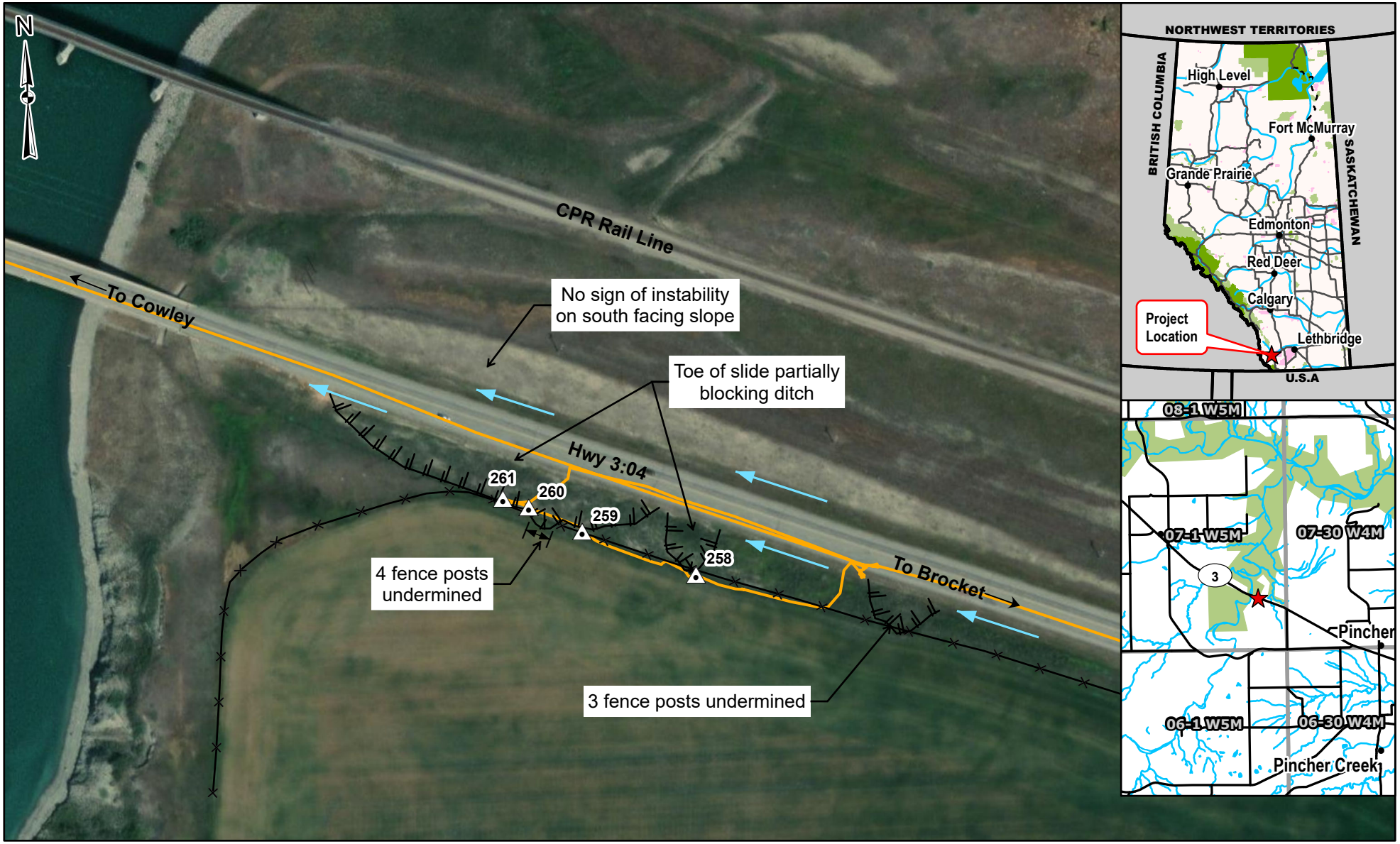
PERMIT TO PRACTICE
KLOHN CRIPPEN BERGER LTD.

RM SIGNATURE: _____

RM APEGA ID #: 187607

DATE: 13 Oct. 2023

PERMIT NUMBER: P009196
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)



0 100 Metres

Legend

- GPS Waypoint (May 8, 2023)
- GPS Track (May 8, 2023)
- Flow Direction
- Scarp
- Fence

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 11N
3. IMAGE SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS AND THE GIS USER COMMUNITY.

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
S048 - Castle Back Slope Failures
Hwy 3:04, km 23.708

SCALE	PROJECT No.	FIG No.
1:2,500	A05116A03	1

File: Z:\AC\GY\Alberta\A05116A03 ABT Southern Region GRMP\400 Drawings\2023\01_ProFile\Section B\ABT_Southern_SectionB_230713\ABT_Southern_SectionB_230717.aprx Date: Time: Creator: : aharrison

Photo 1 **Toe rolls from formerly separate slope failure zones coalescing and blocking the ditch. Photo was taken facing southeast on May 10, 2023.**

Photo 2 **Toe rolls coalescing and blocking the ditch. Photo was taken facing west on May 10, 2023.**

Photo 3 **Slope on the south side of the road. Photo was taken facing west on May 10, 2023.**